ANALYTICAL SUMMARY REPORT

August 15, 2018

Genesis Enterprises
819 MT Hwy 82
Somers, MT 59932

Work Order: H18080014 Quote ID: H1656

Project Name: Biochar

Energy Laboratories Inc Helena MT received the following 1 sample for Genesis Enterprises on 8/1/2018 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
H18080014-001	Genesis Biochar	07/30/18 15:00	08/01/18	Soil	Metals by ICP/ICPMS, Total Mercury in Solid By CVAA Moisture Total Metals Digestion by SW3050B Mercury Digestion by SW7471B Soil Preparation USDA1

The analyses presented in this report were performed by Energy Laboratories, Inc., 3161 E. Lyndale Ave., Helena, MT 59604, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

The results as reported relate only to the item(s) submitted for testing.

If you have any questions regarding these test results, please call.

Report Approved By: Jonathan D. Hager
Helena Laboratory Manager

Digitally signed by
Jonathan Hager
Date: 2018.08.15 13:12:28 -06:00

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Genesis Enterprises
Project: Biochar
Lab ID: H18080014-001
Client Sample ID: Genesis Biochar

Report Date: 08/15/18
Collection Date: 07/30/18 15:00
DateReceived: 08/01/18
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
3050 EXTRACTABLE METALS							
Arsenic	20	mg/kg		1		SW6020	08/13/18 16:40 / sld
Cadmium	2	mg/kg		1		SW6020	08/10/18 17:02 / sld
Cobalt	1	mg/kg		1		SW6020	08/10/18 17:02 / sld
Lead	7	mg/kg		1		SW6020	08/10/18 17:02 / sld
Molybdenum	1	mg/kg		1		SW6020	08/10/18 17:02 / sld
Nickel	4	mg/kg		1		SW6020	08/10/18 17:02 / sld
Selenium	ND	mg/kg		1		SW6020	08/10/18 17:02 / sld
Zinc	529	mg/kg	D	3		SW6010B	08/10/18 17:40 / sld
METALS, TOTAL							
Mercury	ND	mg/kg		0.50		SW7471B	08/08/18 15:43 / dck

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Genesis Enterprises
Project: Biochar

Report Date: 08/15/18
Work Order: H18080014

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **SW6010B**								Analytical Run: ICP2-HE_180810A	
Lab ID: **ICV**	Initial Calibration Verification Standard							08/10/18 09:37	
Zinc	0.788	mg/L	0.010	99	90	110			
Lab ID: **ICSA**	Interference Check Sample A							08/10/18 09:54	
Zinc	0.00370	mg/L	0.010		0	0			
Lab ID: **ICSAB**	Interference Check Sample AB							08/10/18 09:58	
Zinc	0.989	mg/L	0.010	99	80	120			
Method: **SW6010B**								Batch: 42639	
Lab ID: **MB-42639**	Method Blank				Run: ICP2-HE_180810A			08/10/18 17:28	
Zinc	ND	mg/kg	0.6						
Lab ID: **LFB-42639**	Laboratory Fortified Blank				Run: ICP2-HE_180810A			08/10/18 17:32	
Zinc	48.4	mg/kg	1.0	98	80	120			
Lab ID: **LCS-42639**	Laboratory Control Sample				Run: ICP2-HE_180810A			08/10/18 17:36	
Zinc	241	mg/kg	3.1	104	75.3	111.7			
Lab ID: **H18080014-001ADIL**	Serial Dilution				Run: ICP2-HE_180810A			08/10/18 17:44	
Zinc	541	mg/kg	15		0	0	2.2	10	
Lab ID: **H18080014-001APDS**	Post Digestion/Distillation Spike				Run: ICP2-HE_180810A			08/10/18 17:49	
Zinc	787	mg/kg	3.0	102	75	125			
Lab ID: **H18080014-001AMS**	Sample Matrix Spike				Run: ICP2-HE_180810A			08/10/18 17:53	
Zinc	593	mg/kg	2.9		75	125			A
Lab ID: **H18080014-001AMSD**	Sample Matrix Spike Duplicate				Run: ICP2-HE_180810A			08/10/18 17:57	
Zinc	632	mg/kg	3.1		75	125	6.4	20	A
Lab ID: **H18080026-019ADIL**	Serial Dilution				Run: ICP2-HE_180810A			08/10/18 19:12	
Zinc	3150	mg/kg-dry	15		0	0	4.8	10	
Lab ID: **H18080026-019APDS**	Post Digestion/Distillation Spike				Run: ICP2-HE_180810A			08/10/18 19:16	
Zinc	3240	mg/kg-dry	3.0		75	125			A

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Genesis Enterprises
Project: Biochar

Report Date: 08/15/18
Work Order: H18080014

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6020								Analytical Run: ICPMS205-H_180810A	
Lab ID: ICV	Initial Calibration Verification Standard								08/10/18 12:24
Cadmium	0.0300	mg/L	0.0010	100	90	110			
Cobalt	0.0604	mg/L	0.0010	101	90	110			
Lead	0.0603	mg/L	0.0010	100	90	110			
Molybdenum	0.0599	mg/L	0.0010	100	90	110			
Nickel	0.0610	mg/L	0.0010	102	90	110			
Selenium	0.0596	mg/L	0.0010	99	90	110			
Lab ID: ICV	Initial Calibration Verification Standard								08/10/18 16:11
Cadmium	0.0290	mg/L	0.0010	97	90	110			
Cobalt	0.0582	mg/L	0.0010	97	90	110			
Lead	0.0596	mg/L	0.0010	99	90	110			
Molybdenum	0.0583	mg/L	0.0010	97	90	110			
Nickel	0.0587	mg/L	0.0010	98	90	110			
Selenium	0.0600	mg/L	0.0010	100	90	110			
Method: SW6020									Batch: 42639
Lab ID: MB-42639	Method Blank				Run: ICPMS205-H_180810A				08/10/18 16:25
Arsenic	0.07	mg/kg	0.04						
Cadmium	ND	mg/kg	0.02						
Cobalt	ND	mg/kg	0.2						
Lead	ND	mg/kg	0.07						
Molybdenum	ND	mg/kg	0.03						
Nickel	ND	mg/kg	0.08						
Selenium	ND	mg/kg	0.07						
Lab ID: LCS-42639	Laboratory Control Sample				Run: ICPMS205-H_180810A				08/10/18 16:40
Arsenic	167	mg/kg	1.0	85	71.4	105.1			
Cadmium	94.8	mg/kg	1.0	96	73.9	106.1			
Cobalt	106	mg/kg	1.0	98	74.2	105.6			
Lead	109	mg/kg	1.0	104	74.4	108.6			
Molybdenum	116	mg/kg	1.0	91	66.5	103.1			
Nickel	81.6	mg/kg	1.0	95	72.3	105			
Selenium	196	mg/kg	1.0	96	71.2	110.2			
Lab ID: LFB-42639	Laboratory Fortified Blank				Run: ICPMS205-H_180810A				08/10/18 16:42
Arsenic	47.0	mg/kg	1.0	95	80	120			
Cadmium	24.0	mg/kg	1.0	97	80	120			
Cobalt	47.8	mg/kg	1.0	97	80	120			
Lead	48.1	mg/kg	1.0	97	80	120			
Molybdenum	48.9	mg/kg	1.0	99	80	120			
Nickel	48.5	mg/kg	1.0	98	80	120			
Selenium	47.0	mg/kg	1.0	95	80	120			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Genesis Enterprises
Report Date: 08/15/18
Project: Biochar
Work Order: H18080014

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6020								Batch: 42639	
Lab ID: H18080014-001ADIL	Serial Dilution				Run: ICPMS205-H_180810A			08/10/18 17:04	
Arsenic	17.9	mg/kg	1.0		0	0	3.4	10	
Cadmium	2.32	mg/kg	1.0		0	0		10	N
Cobalt	ND	mg/kg	4.6		0	0		10	
Lead	6.83	mg/kg	1.8		0	0		10	N
Molybdenum	1.32	mg/kg	1.0		0	0		10	N
Nickel	4.09	mg/kg	1.8		0	0		10	N
Selenium	ND	mg/kg	1.7		0	0		10	
Lab ID: H18080014-001APDS1	Post Digestion/Distillation Spike				Run: ICPMS205-H_180810A			08/10/18 17:06	
Arsenic	40.9	mg/kg	1.0	91	75	125			
Cadmium	25.3	mg/kg	1.0	93	75	125			
Cobalt	24.0	mg/kg	1.0	93	75	125			
Lead	30.1	mg/kg	1.0	94	75	125			
Molybdenum	24.7	mg/kg	1.0	95	75	125			
Nickel	26.7	mg/kg	1.0	93	75	125			
Selenium	22.7	mg/kg	1.0	93	75	125			
Lab ID: H18080014-001AMS	Sample Matrix Spike				Run: ICPMS205-H_180810A			08/10/18 17:08	
Arsenic	63.6	mg/kg	1.0	93	75	125			
Cadmium	25.4	mg/kg	1.0	95	75	125			
Cobalt	46.0	mg/kg	1.0	92	75	125			
Lead	54.3	mg/kg	1.0	97	75	125			
Molybdenum	46.8	mg/kg	1.0	94	75	125			
Nickel	49.0	mg/kg	1.0	93	75	125			
Selenium	45.2	mg/kg	1.0	93	75	125			
- S= Spike recovery outside of QC advisory limits. The recovery in the Laboratory Control Sample was within QC advisory limits. This suggests that the Matrix Spike recover is due to matrix interference.									
Lab ID: H18080014-001AMSD	Sample Matrix Spike Duplicate				Run: ICPMS205-H_180810A			08/10/18 17:10	
Arsenic	68.7	mg/kg	1.0	96	75	125	7.7	20	
Cadmium	27.2	mg/kg	1.0	95	75	125	6.8	20	
Cobalt	50.0	mg/kg	1.0	94	75	125	8.4	20	
Lead	58.4	mg/kg	1.0	99	75	125	7.3	20	
Molybdenum	50.3	mg/kg	1.0	94	75	125	7.2	20	
Nickel	53.4	mg/kg	1.0	95	75	125	8.4	20	
Selenium	47.6	mg/kg	1.0	92	75	125	5.1	20	
- S= Spike recovery outside of QC advisory limits. The recovery in the Laboratory Control Sample was within QC advisory limits. This suggests that the Matrix Spike recover is due to matrix interference.									
Lab ID: H18080026-019ADIL	Serial Dilution				Run: ICPMS205-H_180810A			08/10/18 17:21	
Arsenic	9280	mg/kg-dry	4.6		0	0	6.0	10	
Cadmium	3.41	mg/kg-dry	2.1		0	0		10	N
Cobalt	ND	mg/kg-dry	23		0	0		10	
Lead	3100	mg/kg-dry	8.8		0	0	6.6	10	
Molybdenum	ND	mg/kg-dry	4.0		0	0		10	
Nickel	ND	mg/kg-dry	9.1		0	0		10	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

N - The analyte concentration was not sufficiently high to calculate a RPD for the serial dilution test.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Genesis Enterprises
Report Date: 08/15/18
Project: Biochar
Work Order: H18080014

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **SW6020**									Batch: 42639
Lab ID: **H18080026-019ADIL**	Serial Dilution				Run: ICPMS205-H_180810A				08/10/18 17:21
Selenium	ND	mg/kg-dry	8.4		0	0		10	
Lab ID: **H18080026-019APDS1**	Post Digestion/Distillation Spike				Run: ICPMS205-H_180810A				08/10/18 17:23
Arsenic	9290	mg/kg-dry	1.0		75	125			A
Cadmium	127	mg/kg-dry	1.0	103	75	125			
Cobalt	126	mg/kg-dry	4.6	105	75	125			
Lead	3200	mg/kg-dry	1.8		75	125			A
Molybdenum	124	mg/kg-dry	1.0	102	75	125			
Nickel	126	mg/kg-dry	1.8	104	75	125			
Selenium	119	mg/kg-dry	1.7	99	75	125			
Method: **SW6020**									Analytical Run: ICPMS205-H_180813B
Lab ID: **ICV**	Initial Calibration Verification Standard								08/13/18 13:16
Arsenic	0.0607	mg/L	0.0010	101	90	110			
Lab ID: **ICV**	Initial Calibration Verification Standard								08/13/18 16:07
Arsenic	0.0608	mg/L	0.0010	101	90	110			
Method: **SW6020**									Batch: 42639
Lab ID: **MB-42639**	Method Blank				Run: ICPMS205-H_180813B				08/13/18 16:31
Arsenic	0.08	mg/kg	0.04						
Cadmium	ND	mg/kg	0.02						
Cobalt	ND	mg/kg	0.2						
Lead	ND	mg/kg	0.07						
Molybdenum	ND	mg/kg	0.03						
Nickel	ND	mg/kg	0.08						
Selenium	ND	mg/kg	0.07						

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Genesis Enterprises
Project: Biochar

Report Date: 08/15/18
Work Order: H18080014

Analyte		Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**SW7471B**								Analytical Run: HGCV201-H_180808A	
Lab ID:	**ICV**	Initial Calibration Verification Standard							08/08/18 15:16	
Mercury		0.00099	mg/kg	0.50	99	90	110			
Lab ID:	**CCV**	Continuing Calibration Verification Standard							08/08/18 15:18	
Mercury		0.0026	mg/kg	0.50	103	90	110			
Method:	**SW7471B**								Batch: 42593	
Lab ID:	**MB-42593**	Method Blank				Run: HGCV201-H_180808A			08/08/18 15:37	
Mercury		ND	mg/kg	0.003						
Lab ID:	**LFB-42593**	Laboratory Fortified Blank				Run: HGCV201-H_180808A			08/08/18 15:39	
Mercury		0.19	mg/kg	0.50	102	80	120			
Lab ID:	**LCS-42593**	Laboratory Control Sample				Run: HGCV201-H_180808A			08/08/18 15:41	
Mercury		5.8	mg/kg	0.50	117	71	126.4			
Lab ID:	**H18080014-001AMS**	Sample Matrix Spike				Run: HGCV201-H_180808A			08/08/18 15:47	
Mercury		0.22	mg/kg	0.50	76	80	120			S
Lab ID:	**H18080014-001AMSD**	Sample Matrix Spike Duplicate				Run: HGCV201-H_180808A			08/08/18 15:49	
Mercury		0.22	mg/kg	0.50	79	80	120	2.8	20	S

Qualifiers:

RL - Analyte reporting limit.
ND - Not detected at the reporting limit.
S - Spike recovery outside of advisory limits.

Work Order Receipt Checklist

Genesis Enterprises

H18080014

Login completed by: Jessica C. Smith
Date Received: 8/1/2018
Reviewed by: BL2000\wjohnson
Received by: JCS
Reviewed Date: 8/14/2018
Carrier name: UPS Ground

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☐	No ☑	
Chain of custody signed when relinquished and received?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☐	No ☑	Not Applicable ☐
Container/Temp Blank temperature:	21.1°C No Ice		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Contact and Corrective Action Comments:

No COC was provided. Analysis taken from enclosed analytical quote. Information on sample includes Joe Clark Genesis Biochar 406 885 4746. Used Genesis Biochar as sample ID and emailed client for collection date and time. JCS 08/01/2018

Energy Laboratories Inc
3161 East Lyndale Avenue
Helena, MT 59601
(406) 442-0711

CHAIN-OF-CUSTODY RECORD

WorkOrder: H18080014

Client:
Genesis Enterprises
819 MT Hwy 82
Somers, MT 59932

TEL:
FAX:
ProjectNo: Biochar
PO:

Created in Laboratory

01-Aug-18

Sample ID	ClientSampID	Matrix	Collection Date	Bottle	Requested Tests						
					D2974	E6010_20	SW7471B	Visual			
H18080014-001	Genesis Biochar	Soil	7/31/2018 12:00:00 PM		A	A	A	A			

Comments:

	Date/Time		Date/Time
Relinquished by:		**Received by:**	
Relinquished by:		**Received by:**	
Relinquished by:		**Received by:**	8-1-18 10:03

NO TB
NO ICE

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other